

A NOVEL FETCH BRANCH ARCHITECTURE FOR REDUCING BRANCH  
PENALTY WITHOUT BRANCH PREDICTION

ABSTRACT OF THE DISCLOSURE

5 In lieu of branch prediction, a merged fetch-branch unit operates in parallel with the decode unit within a processor. Upon detection of a branch instruction within a group of one or more fetched instructions, any instructions preceding the branch are marked regular instructions, the branch instruction is marked as such, and any instructions following branch are marked sequential instructions. Within two cycles, sequential instructions following the last fetched instruction are retrieved and marked, target instructions beginning at the branch target address are retrieved and marked, and the branch is resolved. Either the sequential or target instructions are then dropped depending on the branch resolution, incurring a fixed, 1 cycle branch penalty.